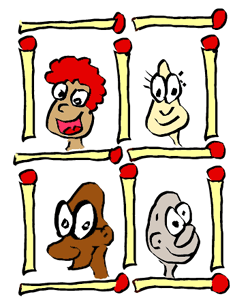
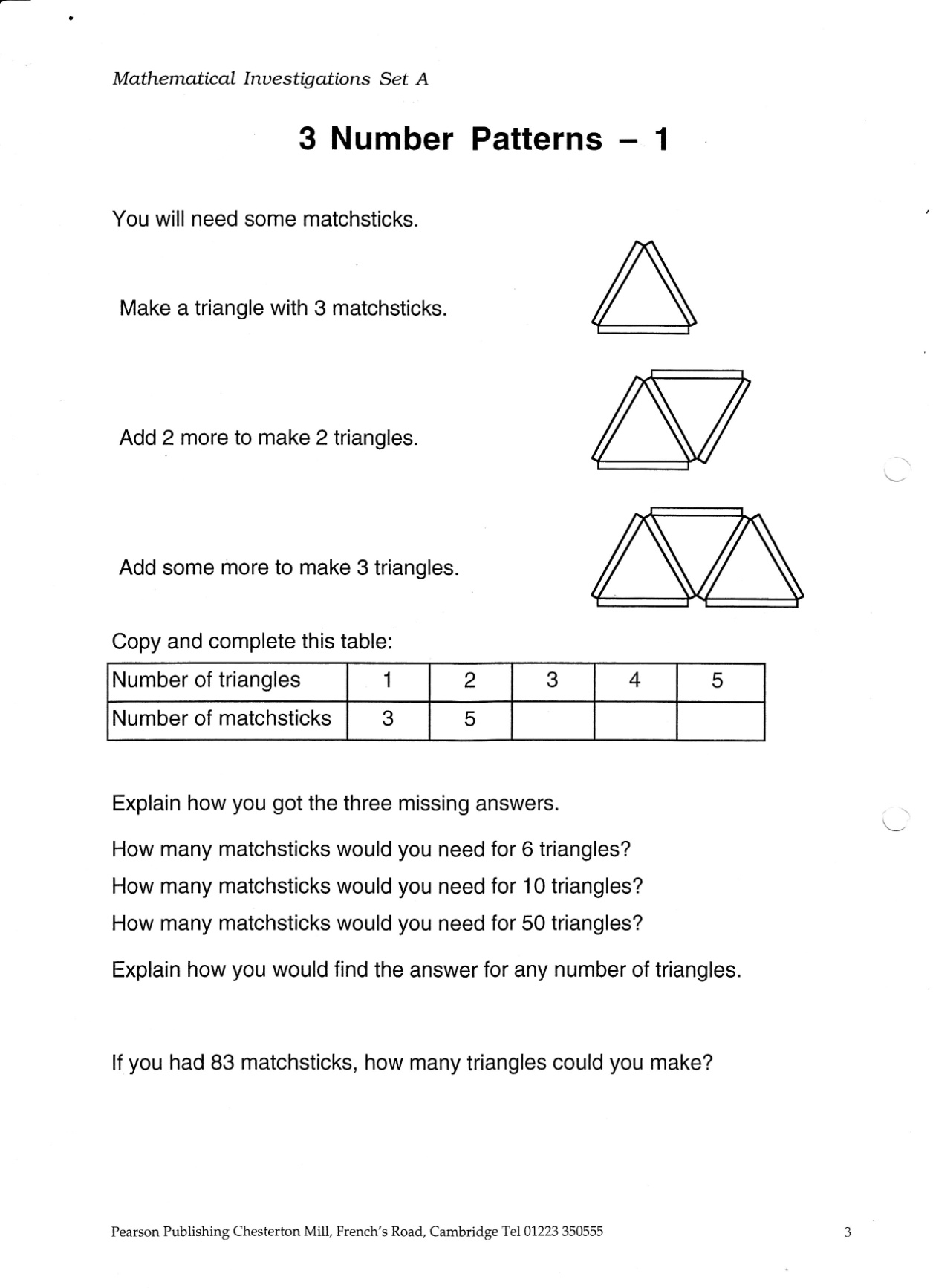
**ESL Grade 7:Investigating Matchstick Patterns** :

In this task you are going to be assessed against **criterion B**; Investigating patterns and **criterion C**; communication in maths

**Pattern number 1**

Add some more matchsticks to make 4 and 5 triangles. Draw the diagrams.

Complete this table:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Number of triangles | 1 | 2 | 3 | 4 | 5 |
| Number of matchsticks | 3 |  |  |  |  |

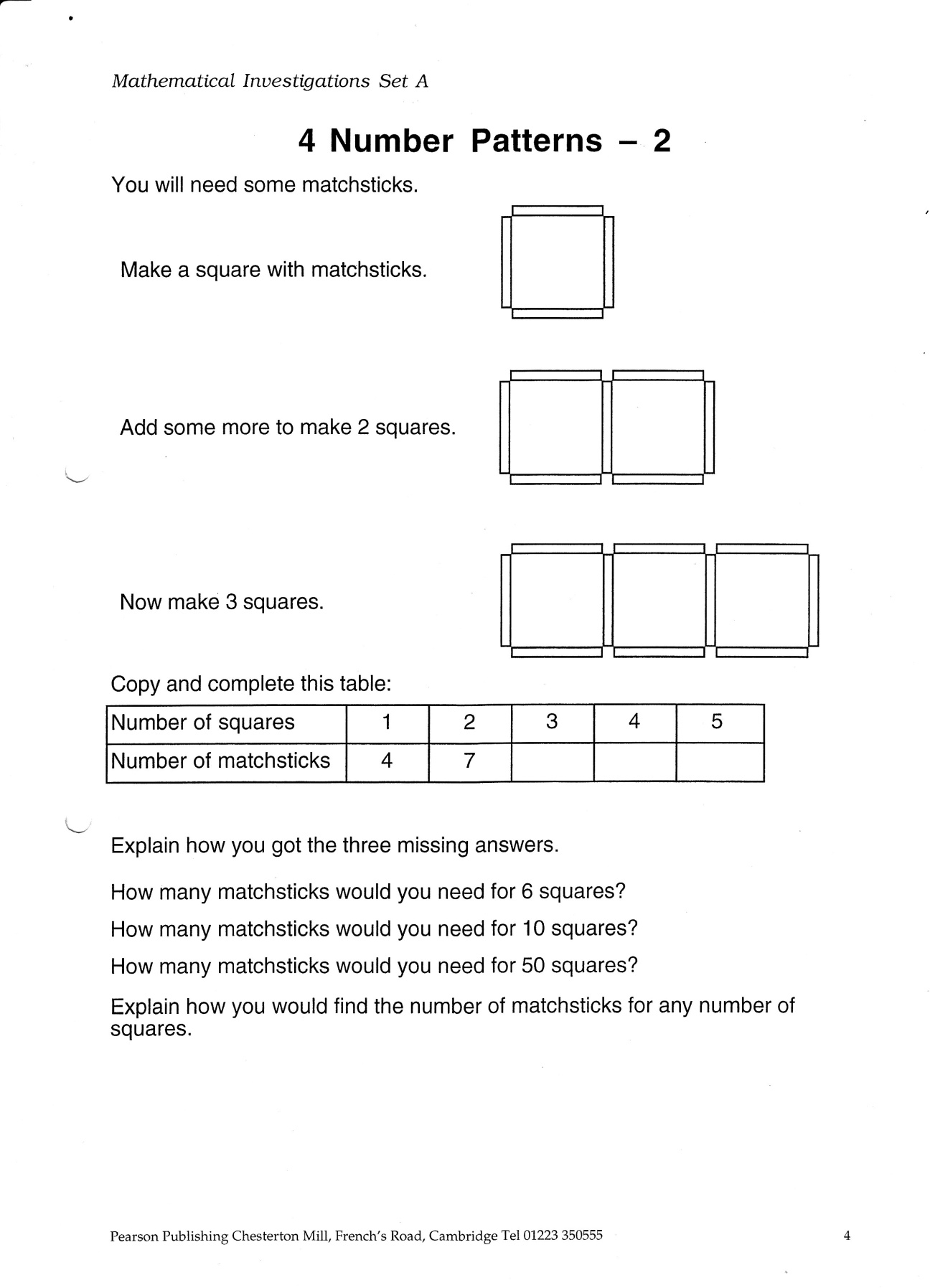
What pattern do you see?

Use your pattern to find how many matchsticks you would need for:

* 6 triangles
* 10 triangles
* 20 triangles

How would you find the number of matchsticks for 50 triangles?

**Pattern number 2**



Add some more matchsticks to make 4 and 5 squares. Draw the diagrams.

Copy and complete this table:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Number of squares | 1 | 2 | 3 | 4 | 5 |
| Number of matchsticks | 4 |  |  |  |  |

State the patterns you see.

Use your pattern to find how many matchsticks you would need for:

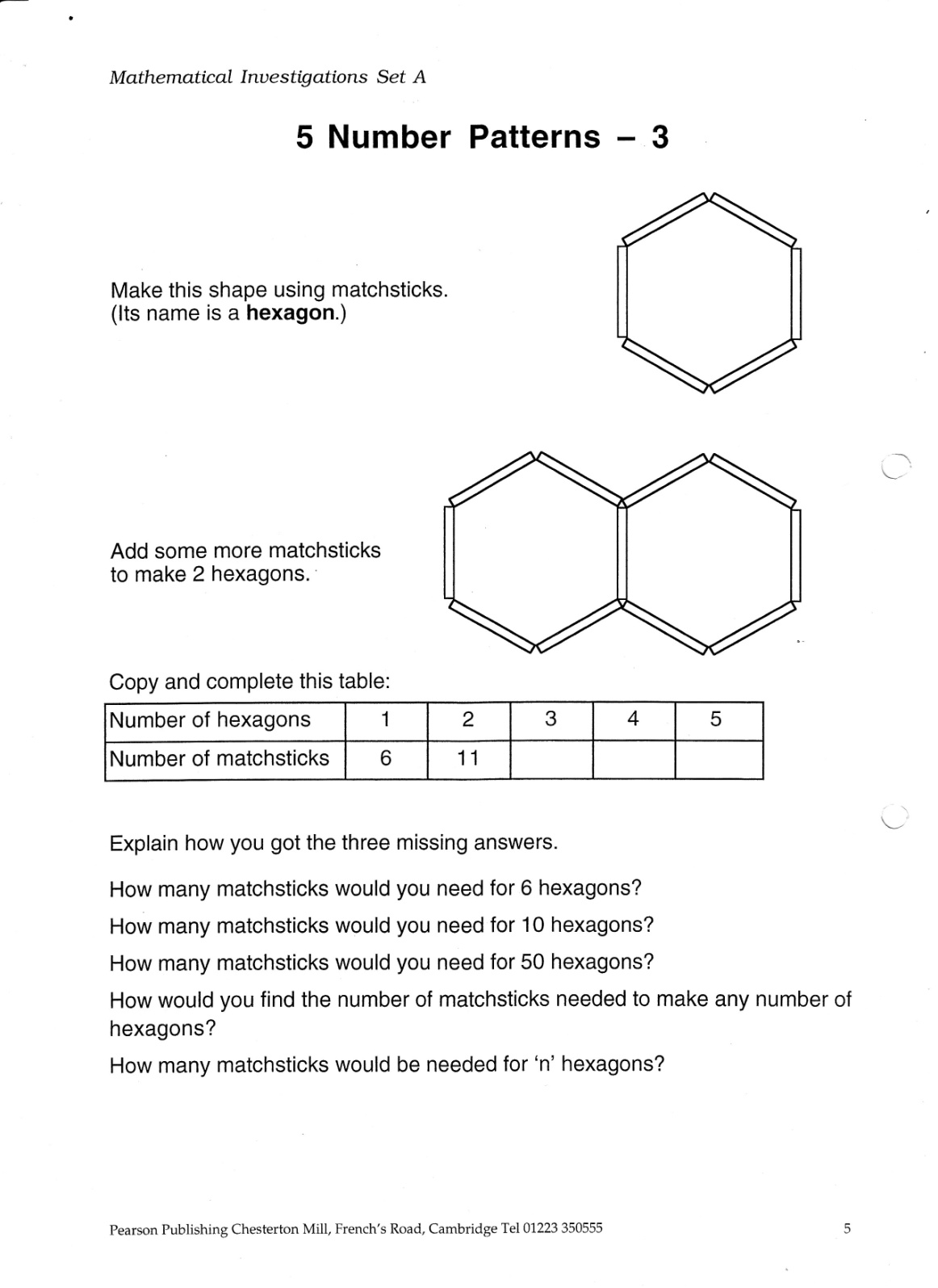
* 6 squares
* 10 squares

Develop a **rule** or relationship that would allow you to find the number of matchsticks needed for 50 squares.

Why does your **rule** or relationship work?

Use your **rule** or relationship to find the number of matchsticks you would need for 88 squares.

**Pattern number 3**



Add some more matchsticks to make 3 and 4 hexagons. Draw the diagrams.

Copy and complete this table:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Number of hexagons | 1 | 2 | 3 | 4 | 5 |
| Number of matchsticks | 6 |  |  |  |  |

State any patterns you see.

Use your pattern to find how many matchsticks you would need for:

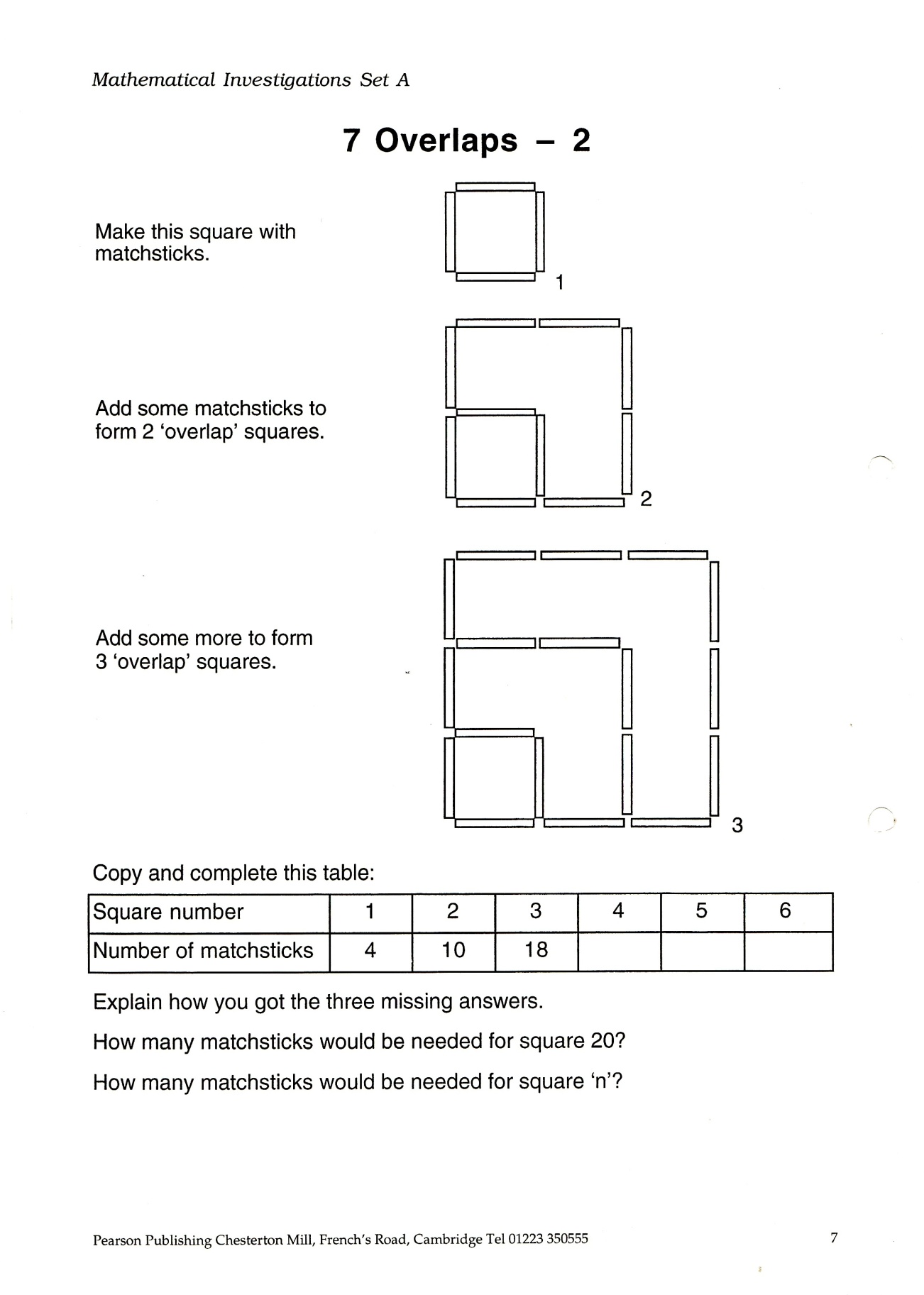
* 6 hexagons
* 10 hexagons

State **rule** or relationship that would allow you to find the number of matchsticks needed for 50 hexagons.

Explain why you **rule** works.

Find the number of matchsticks you would need for 67 hexagons.

**Pattern number 4**

**A more difficult pattern**

Add some more matchsticks to make 4 and 5 overlaps. Draw the diagrams.

Copy and complete this table:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Square number | 1 | 2 | 3 | 4 | 5 |
| Number of matchsticks | 4 | 10 |  |  |  |

State any patterns you see.

Use your pattern to find how many matchsticks you would need for:

* Square number 7
* Square number 10

Write a rule to find how many matchsticks would you need for square number ***n***?

Use your rule to fine the number of matchsticks needed for square number 25.

Explain why you **rule** or relationship works.